



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SR-6J

November 1, 2013

VIA ELECTRONIC MAIL AND CERTIFIED MAIL

Weyerhaeuser Company
Attention: Richard Gay
810 Whittington Ave.
Hot Springs, AR 71902

Re: Plainwell Mill, Operable Unit #7, Allied Paper, Inc./Portage Creek/Kalamazoo River
Superfund Site -- EPA Comments on Feasibility Study, dated June 2013

Dear Mr. Gay:

Pursuant to the Consent Decree for the Design and Implementation of Certain Response Actions at Operable Unit #4 and the Plainwell Inc. Mill Property of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site (Site), Conestoga-Rovers & Associates, Inc. (CRA), Weyerhaeuser Company's (Weyerhaeuser) environmental consultant, submitted a Feasibility Study (FS) on June 27, 2013 for Weyerhaeuser.

After reviewing your submittal, the United States Environmental Protection Agency (EPA) disapproves the FS and provides EPA and Michigan Department of Environmental Quality (MDEQ) comments in the Enclosure.

Per the Consent Decree, a revised FS that corrects all the deficiencies must be submitted within 30 days of receipt of this letter for review. If you have any questions or comments regarding this letter, please contact me at (312) 353-4150 or via email at desai.sheila@epa.gov.

Sincerely,

A handwritten signature in cursive script, reading "Sheila Desai", is written over a horizontal line.

Sheila Desai
Remedial Project Manager

Enclosure

cc: J. Saric, EPA (e-mail)
P. Bucholtz, MDEQ (e-mail)

G. Carli, CRA (e-mail)
J. Quigley, CRA (e-mail)
J. Lifka, SulTRAC (e-mail)
J. Carlson, EPA (e-mail)

**COMMENTS ON FEASIBILITY STUDY REPORT
PLAINWELL MILL SITE, OPERABLE UNIT 7 OF
ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE
PLAINWELL, KALAMAZOO COUNTY, MICHIGAN**

The draft Feasibility Study (FS) Report dated June 2013 was prepared by Conestoga-Rovers & Associates, Inc., (CRA) for Weyerhaeuser Company (Weyerhaeuser), the signatory to the Consent Decree for the site. The U.S. Environmental Protection Agency's (EPA) and the Michigan Department of Environmental Quality's (MDEQ) general and specific comments are presented below. The first complete paragraph on each page is identified as "Paragraph 1." An incomplete paragraph at the top of a page (one that carries over from the previous page) is identified as "Paragraph 0."

GENERAL COMMENTS

1. The FS report showed lack of detail and explanation throughout the document. It was difficult to determine what information was being used and why. The document should clearly explain why and how specific conclusions were made or why certain things were eliminated.
2. The FS report should be a standalone document such that one does not need to refer to the RI report to understand the nature and extent of contamination at the site. The RI data, specifically the chemicals of concern, should be summarized in tables within the text of the document. The physical setting of the site, including geology and hydrology, drinking water aquifer information, and groundwater flow (including figure or reference to Appendix E figure) should be discussed in greater detail in the FS report (some of this information is listed in Section 3.2.2).
3. The RI Report does not need to be included in an Appendix. It can be listed as a separate reference and continue to be referenced in the document. Adding an 8,000+ page document to an Appendix makes the electronic version difficult to read.
4. The background information section should include a discussion on the Emergency Response Action at the banks that was conducted at the site. It would be beneficial to know what was previously remediated at the site, especially when Remedial Action Objective (RAO) 5 includes preventing contamination of the Kalamazoo River.
5. The FS report includes alternatives proposing soil excavation within areas with contaminant concentrations above residential/non-residential preliminary remediation goals (PRG) for land-use-based criteria, and alternatives proposing soil excavation within areas with contaminant concentrations above residential PRGs. The report however, only includes one figure (Figure 3.1) showing conceptual areas of impacted soil above PRGs. The FS report should be revised to include separate figures showing (1) conceptual areas of impacted soil above residential/nonresidential (land-use) PRGs and (2) conceptual areas of impacted soil above residential PRGs. Separate figures are necessary because

the first scenario assumes 9,690 cubic yards of soil would be excavated and the second scenario assumes 22,570 cubic yards of soil would be excavated.

6. Note that additional figures to that in General Comment 5 may also be necessary to demonstrate the proposed soil excavation based on the risk-based cleanup goals. The risk-based arsenic cleanup goal has not been selected and the entire EPA range of $1\text{E-}04$ to $1\text{E-}06$ needs to be evaluated. If $1\text{E-}04$ or Hazard Index=1 does not meet the applicable or relevant and appropriate requirements (ARARs), then a figure may not be necessary; however, this should be discussed in the text as to why it was not included. Also, if $1\text{E-}06$ risk levels are below background then the lower range should be background and a figure depicting excavation based on background for arsenic should be shown.
7. The FS report should have a figure showing the actual site groundwater concentrations (i.e. actual contamination coming from the site) that are above naturally occurring background concentrations in order to determine what groundwater contamination is at the site. The FS report should also have a figure demonstrating the groundwater picture of what was discussed in Section 3.2.2 in order to visualize the discussion including distinguishing between aesthetic and human health risk-based exceedances.
8. The structure of the alternatives is somewhat confusing. It would have been much simpler and easier to read and understand if the alternatives were constructed in two parts (soil and groundwater separately) as presented in the alternatives array. The 'No Action' alternative or 'Institutional Controls Only' alternative have been removed as groundwater alternatives as an option with other soil remedies. Since groundwater contamination has not been adequately demonstrated by a figure and actual on-site concentrations, it is difficult to determine which groundwater remedy is necessary at the site. If it is determined by the figure and discussion that there is not a groundwater issue at the site then there would be no groundwater RAOs and no groundwater remedies.
9. It is not clear why the groundwater portion of the alternatives is broken down into Groundwater/ Surface Water Interface (GSI) mixing zone and monitored natural attenuation (MNA). Both are monitoring programs. Does the GSI meet RAOs and ARARs? Explain why there are the two monitoring possibilities and the differences.
10. Synthetic Precipitation Leaching Procedure (SPLP) is discussed in the RI, but not in the FS. There are several areas listed in the RI that fail SPLP, but are not discussed further. Provide an explanation of how failed SPLP is addressed in the alternatives or cleanup levels.
11. The title of Alternatives 2a and 2b are "excavation, consolidation and capping with groundwater monitoring for mixing zone-based evaluation" and "excavation, consolidation and capping with groundwater monitoring for mixing zone-based evaluation and MNA," respectively. Although some soil would be consolidated and capped on site, consolidation applies only to inorganic-impacted soil; soil impacted with volatile organic compounds (VOC), semivolatile organic compounds (SVOC), and polychlorinated biphenyls (PCB) would be disposed of off-site. The titles and

descriptions of these alternatives throughout the report should be revised to reflect that off-site disposal is also a component of these alternatives.

12. One component of Alternatives 2a and 2b is consolidation and capping. Minimal information is provided with respect to the capping component. The FS report should be revised to show the conceptual location or locations of on-site consolidation, and to describe the anticipated cap construction to better support the cost estimates and the statement that the alternatives “comply with ARARs.”
13. The “3” series alternatives (3a and 3b) include alternatives proposing soil excavation within areas with contaminant concentrations above residential/non-residential PRGs for land-use based criteria. The “4” series alternatives (4a and 4b) include alternatives proposing soil excavation within areas with contaminant concentrations above residential PRGs. The text in Section 4 should provide the basis or rationale for proposing two different soil cleanup goals.
14. The “a” alternatives include groundwater monitoring for mixing zone-based evaluation, and the “b” alternatives include groundwater monitoring for mixing zone-based evaluation and MNA. The text in Section 4 should provide the basis or rationale for proposing two different groundwater monitoring programs.
15. The descriptions of all the “a” series alternatives in Section 4 state that completion of a mixing zone-based evaluation and monitoring program would be implemented to achieve RAOs 2, 6, and 7. It is not clear as to how a mixing zone-based evaluation and monitoring program would eliminate potential for leaching of contaminants from soil to groundwater as stated in RAO 2. The text throughout Section 4 should be revised to clarify this statement.
16. The descriptions of all the “a” series alternatives in Section 4 state that completion of a mixing zone-based evaluation and monitoring program would be implemented to achieve RAOs 2, 6, and 7. It is not clear as to how a mixing zone-based evaluation and monitoring program would prevent human exposure to groundwater as stated in RAO 6. The text throughout Section 4 should be revised to clarify this statement.
17. Under individual analysis of alternatives (presented in Section 5.2), the text is too vague regarding how each alternative complies with ARARs. The statement that each alternative “complies with ARARs as identified in Table 2.1” provides little insight as to compliance with specific ARARs during remedy implementation. As one example, the 2-series alternatives include consolidation and capping of some soil on site, yet the type of cap to be used is not discussed; therefore, compliance with ARARs cannot be evaluated. Thus, the text should be revised to provide details on how each alternative complies with ARARs.
18. The detailed analysis of alternatives presented in Section 5.2 evaluates each alternative relative to meeting containment objectives. The text should clarify that using a mixing

zone evaluation and groundwater monitoring program to evaluate groundwater discharge to surface water does not in and of itself meet the containment objective. The monitoring component of each alternative is a means to evaluate whether containment has been achieved by other components of the alternatives. Therefore, monitoring would simply trigger any contingency measures if contaminants of concern are shown to be migrating from groundwater to surface water. The text should be revised to provide this clarification.

19. The detailed analysis of alternatives presented in Section 5.2 evaluates each alternative relative to meeting restoration objectives. Further explanation is needed as to how the “a” series alternatives that contain a mixing zone-based evaluation and monitoring program component (as opposed to the “b” series alternatives that also contain an MNA component) will suffice for demonstrating that groundwater has been restored at and beyond the point of compliance to its beneficial use within a reasonable timeframe.
20. The detailed analysis of alternatives presented in Section 5.2 evaluates each alternative relative to its implementability. The text states that limited asbestos abatement within some of the former Mill buildings would be required. No previous discussion of asbestos abatement appears in the report. The descriptions of each alternative presented in Section 4 should be revised to discuss potential asbestos abatement and associated work within any buildings.
21. Update acronym list to include all acronyms used in the document.

SPECIFIC COMMENTS

1. **Section 1.2.1, Pages 4-5.** Section 1.2.1 Paragraph 3 discusses that the remaining residuals from various settling lagoons were consolidated into the four westerly lagoons. This language suggests that easterly lagoons contain no residuals. Please clarify.
2. **Section 1.2.3, Pages 8-16.** Section 1.2.3 summarizes the nature and extent of contamination at the site, however it is missing the actual extent of contamination. Throughout the section it states “metals” or “VOCs” or “SVOCs” exceed Part 201 criteria. The section should be specific as to what chemical of concern exceeds the criteria, where, by how much does it exceed/highest concentrations, and to how deep it is contaminated. The information should be summarized in tables. It is difficult to get a clear picture of what the contamination is at the site. All metals do not exceed Part 201 Drinking Water Criteria in each area. This section should summarize the actual nature and extent of contamination at the site. (See General Comment 1).
3. **Section 1.2.3, Pages 8-16.** Section 1.2.3 discusses the exceedances of Part 201 criteria in various areas. The issue of residuals in the areas is being ignored. The FS should discuss the presence of residuals which are assumed to be PCB impacted and that material has not been characterized analytically. Commercial Area 4 mentions PCBs above Part 201

criteria, but should discuss the high PCB detections encountered along the river near the mill race (See General Comment 1).

4. **Section 1.2.5, Pages 18-25.** CRA provided a table to EPA and MDEQ at the meeting in Plainwell, MI on March 20, 2013 that summarized which COCs exceeded risk levels 1E-04 and 1E-06 for each receptor. This table would be helpful if added to this section to understand the risks at the site.
5. **Section 1.2.5, Page 24-25.** Section 1.2.5 states that there are no target risk and hazard level exceedances for the Waterfront Plaza, Commercial Areas 1, 2, 3, and 4. It is inappropriate to imply that each development area was characterized individually as suggested. Some development areas are too small to suggest they have been fully characterized, and adjacent data is likely as applicable for such a small section of the site. For example, data sets are very limited in these smaller development areas for making such definitive statements. The development areas were not characterized separately. The text should be revised.
6. **Section 1.2.6, Page 28.** Section 1.2.6 states that because this area is anticipated to be fully developed under the current redevelopment plan, no further evaluation of risk to ecological receptors will be undertaken. Such a statement as future use restriction will need to be supported with appropriate property use restrictions. Also, what if redevelopment does not occur? Would the land use change? If so, a contingency should be listed in the remedial alternatives if there is a change in land use, then re-evaluate for risk assessment.
7. **Section 2.1, Page 34, Paragraph 2.** Delete the sentence “in addition, chemical –specific ARARs are usually derived from the SDWA rather than the SDWA being an ARAR.”
8. **Section 2.1, Page 35, Paragraph 3.** This paragraph discusses EPA Primary Maximum Contaminant Levels (MCLs) (or Part 201 Drinking Water Criteria where more stringent, or Site-specific background where higher) are considered to be PRGs for groundwater. A table clarifying which value from which regulation (or background) for each chemical of concern would be beneficial. It is not clear which regulation is the ARAR and why. The document mentions site-specific background in this paragraph; however, it is not mentioned anywhere else in the document. Are there background wells to determine site-specific groundwater concentrations? This should be discussed or eliminated from the text. It would appear that possibly MW-17, MW-16, and/or MW-3 could be background wells at the site though it is not demonstrated or discussed in the document. This paragraph also infers that PRGs are to be achieved only at the point of compliance (POC). The document does not describe what the POC is or what is meant by the POC. It is not correct to assume that there is only one point at the Site where PRGs will need to be met.
9. **Section 2.1 Potential ARARs (and related sections).** Add 40 C.F.R. 761.61 (PCB Remediation Waste) as an ARAR.

10. **Section 2.2 Preliminary Remediation Goals (PRGs) (and related sections)** – 40 CFR 761.61 should also be evaluated for the chemical-specific PRG for PCBs. For each area, the PRG must be based on the more stringent cleanup level out of 40 CFR 761.61 or Part 201 Cleanup Criteria for PCBs.
11. **Section 2.2.2, Pages 36 and 37.** Section 2.2.2 summarizes the development of site-specific, risk-based arsenic PRGs. Section 2.2.2 should be revised to summarize Appendix B as revised to address EPA comments on Appendix B.
12. **Section 2.3, Page 39.** Section 2.3 discusses that based on the conclusions of the RI Report, the RAOs were developed. Based on the conditions encountered during the site activities an RAO should be developed that includes preventing the exposure of visible residuals, relocation of visible residuals, and erosion of visible residuals to adjacent surface waters. RAOs 1 and 2 should identify the most stringent regulation (40 CFR 761.61 and/or Part 201 Cleanup Criteria) for PCBs.
13. **Section 3.1.1, Page 41, Bullet 4.** Soil general response actions (GRA) are identified as bulleted items. The “excavation” GRA should be renamed “excavation and disposal” or a new “disposal” GRA should be included and the text revised accordingly to discuss excavation and disposal separately.
14. **Section 3.2.1, Page 42.** Figure 3.1 presents the conceptual area of materials impacted above the PRGs, based on proposed future land use for the 11 redevelopment areas. An approach that depicts only sampled areas as having exceedances is overly simplistic. Sampled areas are representative of unsampled areas. For example, the fragmentation of the former coal pile area into isolated sample locations is overly simplistic and places too much value on individual samples and ignores the condition of unsampled areas that are likely to exist based on a larger data set. The text should be revised.
15. **Section 3.2.1, Page 43, Paragraph 3.** This paragraph discusses the areas to be remediated for arsenic and refers to Appendix B for development of risk-based concentrations for arsenic. The text then goes on to refer to information “presented in the above table”; however, no tables are included in this section. The text should be revised to state what the actual arsenic risk-based concentration is, and delete the reference to “the above table” or include the table under discussion.
16. **Section 3.2.1, Page 44, Paragraph 1.** What are the numbers in this section based on? Provide an explanation of how the numbers in the section were generated. What was the risk level initially and what is the risk level after the volume of materials listed was excavated? Why are there areas with no excavations? What alternative is this based on? If it is the same volume for all alternatives, the text should state this. If the amount excavated varies for all alternatives then the values should be listed for all alternatives. More explanation should be given as to why the amount excavated remains the same for all alternatives for each area.

17. **Section 3.2.2, Page 45, Paragraph 4.** This paragraph discusses that the GSI pathway would only be relevant in the northwestern portion of the Site and only MW-12S/D would represent compliance points. The FS appears to draw the conclusion that groundwater does not discharge to the adjacent surface water body. Where is the data presented to support this conclusion? Also, in older contour maps (January 2010), it shows that MW-7 may also be a compliance point.
18. **Section 3.2.2, Page 46, Paragraph 1.** This paragraph discusses how iron and manganese exceed health-based Part 201 standards versus aesthetic-based standards; however the standards are not listed in the document. The health-based standards should be listed as PRGs in Table 2.3 with a note for the aesthetic values.
19. **Section 3.2.2, Page 52, Paragraph 1 and related sections.** The Arsenic PRG relies on a risk assessment that assumes prohibition of gardening. If this Arsenic PRG is retained then all alternatives must include a gardening and appropriate excavation prohibition and restrictive covenant implementing such restriction. Please note that alternatives that leave PCBs between 1 and 10 ppm will require restrictive covenants preventing high occupancy use pursuant to 40 CFR 761.61(8) for such areas. Alternatives that leave contaminants above Part 201 residential cleanup levels will require a restrictive covenant pursuant to MCL 324.20120b.
20. **Section 4.1, Pages 53-63.** Section 4.1 discusses how each alternative would achieve the particular RAOs. RAO 4 and RAO 8 are not mentioned in this section. Therefore, it is assumed that the alternatives do not meet these RAOs. If alternatives provided do not meet all RAOs, an alternative should be provided that will meet all RAOs. Explain why these RAOs are omitted.
21. **Section 4.1, Pages 53-63.** Section 4.1 discusses the components of the remedial alternatives. The options should include removal of the contaminated residuals in area of lagoons using visual criteria.
22. **Section 4.1, Pages 53-63.** Section 4.1 discusses the components of the remedial alternatives. The Section lists Institutional Controls, but does not describe in detail what the Institutional Controls will be. Provide details on the Institutional Controls specific to each alternative or in general if for all alternatives. For example, alternatives that leave PCBs above 1 ppm will require restrictive covenants preventing high occupancy use pursuant to 40 CFR 761.61 for such areas. Alternatives that leave contaminants above Part 201 residential cleanup levels will require a restrictive covenant prohibiting residential use pursuant to Michigan 324.20120b. For alternatives that rely on institutional controls please include an IC relationship matrix chart and attendant map. (See attached sample IC relationship matrix).
23. **Section 4.2.2, Page 64, Paragraph 5.** This paragraph states that the 2-series and 3-series alternatives would require institutional controls to be effective. The FS report should be revised to move this discussion under Section 4.2.1 (Effectiveness) rather than Section 4.2.2 (Implementability).

- 24. Section 5.1.2, Page 67, Item 7.** The text states that the cost estimates do not include costs associated with predesign activities. Although the predesign costs are not expected to impact the overall cost estimates relative to the +50/-30 percent accuracy range required in an FS, the predesign activities are different for the 2-, 3-, and 4-series alternatives and should be presented in the FS report. In addition, the text should explain why a 4 percent discount rate was selected for calculating net present value costs. A 4 percent discount rate is too low. EPA typically uses a real discount rate of 7 percent at all non-Federal facility sites. (See OSWER 9355.0-75/ EPA 540-R-00-002 "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study"). The text and cost tables presented in Appendix E should be revised accordingly.
- 25. Section 5.2.1, Page 69, Paragraph 0.** This paragraph discusses the long-term effectiveness of the no action alternative. The text states that groundwater contamination would continue to be reduced through natural attenuation occurring at the site. The text should be revised to state that groundwater contamination would "likely" or "potentially" be reduced through natural attenuation; however, the effects of MNA would be unknown, as groundwater would not be monitored.
- 26. Section 5.2.2, Pages 71-90, Restoration Objectives.** The Restoration Objectives paragraph states to "restore impacted groundwater at and beyond the groundwater point of compliance to its anticipated beneficial use in a reasonable timeframe". The RAO should be to restore groundwater to beneficial use throughout the site. Adding a point of compliance to the objectives in these paragraphs assumes that groundwater is only restored at one point on the site rather than throughout the entire site itself. This does not meet the RAO. The text should be revised.
- 27. Section 5.2.3.1, Page 78, Paragraph 1.** This paragraph evaluates Alternative 3a with respect to overall protection of human health and the environment. The text states that the alternative provides overall protection through removal and off-site disposal of VOC-, SVOC-, and/or PCB-impacted soil. The text should be revised to state that this alternative also addresses inorganic-impacted soil. This revision is also required for the evaluation of Alternatives 3b, 4a, and 4b.
- 28. Section 5.2.3.1, Page 80, Paragraph 4.** This paragraph evaluates Alternative 3a with respect to short-term effectiveness. The text states that the estimated time for construction is less than 1 year, after which the containment systems should be operational and effective. Because this alternative consists of excavation and off-site disposal and groundwater monitoring, the text should be revised to explain why this discussion refers to "containment systems." This explanation is also required for evaluation of Alternatives 3b, 4a, and 4b.
- 29. Section 5.3.3, Page 93, Paragraph 5.** This paragraph provides a comparative analysis of each alternative's long-term effectiveness and permanence. The text states that the long-term effectiveness and permanence of all alternatives (other than no action) depends on the design, operation, maintenance, and monitoring of the containment systems.

According to the alternative descriptions presented in Section 4, only Alternatives 2a and 2b include containment components (capping). The text should be revised to clarify what containment systems apply to Alternatives 3a, 3b, 4a, and 4b, or this statement should be modified accordingly.

30. **Section 5.3.7, Page 95, Paragraph 5.** This paragraph discusses costs associated with the remedial alternatives and refers to Table 5.1. The text should be revised to include at least a minimal discussion comparing operation and maintenance (O&M) costs associated with capping alternatives to O&M costs of non-capping alternatives. Similar discussion should also be presented comparing costs of excavation to land-use cleanup goals to costs of excavation to residential cleanup goals, as well as comparing costs of mixing zone groundwater monitoring to costs of mixing zone plus MNA monitoring.
31. **Table 2.1 ARARs** Modify the table to add Safe Drinking Water Act, 40 CFR Part 141 MCLs as an ARAR.
32. **Table 2.4.** Modify the table to show whether the value indicated is based on a cancer risk level or Hazard Quotient (a footnote may be easiest). The table should (1) include a column with the background value for ease of comparison to the risk-based value or (2) be revised such that the values do not go below background and list the background value instead and note it. If the table is modified to include background values, a footnote to the table should be added to state the source of the background values that were used and why.
33. **Figure 3.1.** Figure 3.1 presents conceptual areas of impacted soil above PRGs. As currently developed, Figure 3.1 presents only those arsenic locations that must be removed to meet PRGs based on a target risk (TR) of $1\text{E-}05$ as described in Appendix B. As discussed in comments on Appendix B, PRGs (identified as risk-based concentrations [RBC] in Appendix B) must be developed and evaluated based on a TR of $1\text{E-}06$. Therefore, Section 3.1 must be revised or multiple versions of Figure 3.1 must be prepared showing the conceptual areas of impacted soil above PRGs based on TRs of $1\text{E-}06$ and $1\text{E-}05$ (or background if TR of $1\text{E-}06$ is below background). See General Comment 6.

APPENDIX B GENERAL COMMENTS

1. Appendix B calculates receptor-specific risk-based concentrations (RBC) of arsenic in soil based on target risks of $1\text{E-}06$, $1\text{E-}05$, and $1\text{E-}04$, as well as a target hazard quotient (THQ) of 1. However, the proposed RBCs for each area of development are based only on the target risk (TR) of $1\text{E-}05$ and THQ of 1. In turn, Appendix B and the FS evaluate only those soil locations that would have to undergo removal to meet the proposed soil RBCs for arsenic. The EPA requested consideration of RBCs based on the full range of EPA's risk range of $1\text{E-}06$ to $1\text{E-}04$; Appendix B and the FS do not meet this request as currently presented. Appendix B and the FS should be revised to evaluate options for meeting RBCs based on the full range of EPA's risk range. (Note: RBCs based on a TR

of 1E-06 as presented in Appendix B are less than the state-wide default background concentration of arsenic in soil ([5.8 milligrams/kilogram {mg/kg}] [MDEQ 2012]).

2. Appendix B develops site-specific exposure frequencies for residents and commercial/industrial workers based on consideration of adverse weather conditions. The site-specific exposure frequencies are based on consideration “of the number of days where the soil is not snow-covered (and the ground is not frozen) and it is not raining.” Also, the site-specific exposure frequencies are applied equally to all potential exposure pathways (including incidental ingestion, dermal contact, and inhalation of particulates). Several problems were identified with both the development and application of site-specific exposure frequencies.

First, as described in MDEQ Remediation and Redevelopment Division (RRD) Operational Memorandum No. 1, Technical Support Document – Attachment 6, a meteorologically adjusted exposure frequency considers local weather conditions that make soil “unavailable for contact” (MDEQ 2005). Specifically, MDEQ adjusts the exposure frequencies for residents and for commercial/industrial workers to account for Michigan winter assumed to last 4 months (120 days) during which snow cover and frozen soil make soil “unavailable for contact”; MDEQ does not recommend elimination of rainy days. Therefore, Appendix B should be revised to recalculate meteorologically adjusted exposure frequencies for both residents and commercial/industrial workers to NOT remove rain days from consideration. Consistent with MDEQ recommendations, the meteorologically adjusted exposure frequencies for residents and commercial/industrial workers should be specified as 245 days/year and 160 days/year, respectively (MDEQ 2005).

Second, MDEQ recommends application of the meteorologically adjusted exposure frequency only for consideration of the dermal contact exposure pathway (MDEQ 2005). Unadjusted exposure frequencies of 350 days/year and 245 days/year should be applied to the incidental ingestion exposure pathway (MDEQ 2005). Similarly, the inhalation of particulates exposure pathway should also utilize an unadjusted exposure frequency (MDEQ 2007). In particular, use of an unadjusted exposure frequency for the incidental ingestion exposure pathway reflects carriage of soils into a home or place of business that subsequently can be contacted, resulting in incidental ingestion, throughout the year, despite ambient weather conditions.

3. All RBC equations for residents and commercial/industrial workers should be revised as necessary to address revisions described in Appendix B General Comment 2.
4. Appendix B refers to the November 2012 version of EPA’s Regional Screening Levels (RSL). The most recent update to the RSLs is dated May 2013 (EPA 2013). Appendix B should be revised to refer to and utilize the most recent EPA RSLs.

APPENDIX B SPECIFIC COMMENTS

1. **Section 2.1, Pages 2 through 4.** Section 2.1 presents the equations used to calculate receptor-specific RBCs. These equations should be revised to incorporate the revisions described in Appendix B General Comment 2.
2. **Section 2.2.2, Site-Specific Exposure Frequency.** This section describes the basis for the site-specific exposure frequencies (particularly those for residents and commercial workers) that were adjusted to consider local meteorological conditions. This section should be revised in accordance with the revisions described in Appendix B General Comment 2.
3. **Section 2.2.2, Site-Specific Absorption Factors.** This section describes use of an alternative “site-specific” dermal absorption factor that accounts for a reduced dermal absorption of arsenic from weathered soil. While the cited paper presents some interesting information for consideration, two primary factors weigh against use of the suggested alternative dermal absorption factor for arsenic. First, the standard default dermal absorption factor for arsenic in soil of 0.03 (3 percent) is well established and is regularly used throughout the risk assessment community (EPA 2004). Second, no site-specific basis for use of such an alternative dermal absorption factor is provided other than a very general statement that weathered soils “are considered to be more relevant to those soils found at the site.” “Weathered” is a subjective term, and no evidence suggests that dermal absorption of arsenic from site soils will be more like the default value of 3 percent or the suggested alternative of 0.5 percent. Therefore, Appendix B should be revised to use the EPA-recommended dermal absorption factor of 3 percent (0.03) for arsenic in soil (EPA 2004).
4. **Section 2.4.2, Pages 8 through 10.** Section 2.4.2 presents the calculation and evaluation of site- and receptor-specific RBCs for arsenic in soil. This section (including Tables 3 through 16) should be revised to reflect all other recommended revisions. Also, Section 2.4.2 should present and evaluate receptor-specific RBCs that reflect the full range of TRs: 1E-06, 1E-05, and 1E-04. It should be noted that RBCs based on a TR of 1E-06 are expected to be less than the state-wide default background level of 5.8 mg/kg for arsenic in soil. Therefore, Appendix B must be further revised to add a discussion of an appropriate default background concentration of arsenic in soil.

APPENDIX C SPECIFIC COMMENTS

1. **Appendix C, Section 3.3, Page 6, Paragraph 2.** The text describes the source for the ecological screening values used. Although the sources are listed, no hierarchy is provided. The paragraph should identify the following hierarchy for the source of the screening values with the ecological soil screening levels (EcoSSL) having the highest priority, followed by EPA Region 5 Ecological Screening Levels (mammalian only), then

Effroymsen et al (1997), and then the Canadian Council of Ministers of the Environment (CCME).

2. **Appendix C, Section 5.1.1, Page 9, Paragraph 2.** This section notes that background concentrations were considered in the selection of the refined avian benchmarks. The text states that if background levels are higher than the preferred screening value, the next highest screening value above background should be selected as the screening value. If background concentration exceeds the preferred screening value, then background should be used as the screening value. For the example cited in the text, the screening value for cadmium should be 0.9 mg/kg rather than the 3.8 mg/kg from the CCME. The values in Tables 5.1 and 5.2 should be revised.
3. **Appendix C, Section 5.1.2, Page 10, Paragraph 2.** The first sentence states that Table 5.3 identifies the available benchmarks for avian receptors; however, the table identifies the benchmarks for mammalian receptors. The text should be revised to match the table.
4. **Appendix C, Section 5.1.2, Page 10, Paragraph 3.** This section notes that background concentrations were considered in the selection of the refined mammalian benchmarks. The text states that if background levels are higher than the preferred screening value, the next highest screening value above background should be selected as the screening value. If background concentration exceeds the preferred screening value, then background should be used as the screening value. The values in Tables 5.3 and 5.4 should be revised.
5. **Appendix C, Section 6.3, Page 18.** This section presents the rationale for the modified remediation goals for high molecular weight polycyclic aromatic hydrocarbons (PAH), lead, mercury, and zinc. The toxicity reference values (TRV) for this site had been proposed and approved previously and should be used without modification. Numerous statements assert that the values were unrealistically low and must be revised because they resulted in PRGs lower than background. This discussion should be part of an uncertainty analysis of the PRGs rather than a modification of the TRV. Any concern with the values should have been raised earlier.
6. **Appendix C, Table 4.1.** This table shows the rescreening of the revised data set for the site. The ecological screening values (ESV) are identified, but no source information is provided. This information must be added to the table so the reader is clear as to the sources of the ESVs.
7. **Appendix C, Table 5.2.** Table 5.1 presents the refined avian ESVs. The refined ESVs for PCBs and vanadium in Table 5.2 are not consistent with the values in Table 5.1. Table 5.2 must be revised.
8. **Appendix C, Table 5.5.** The table provides the exposure parameters for the avian indicator species. The food ingestion rates are not consistent with the references provided for the American Woodcock and Mourning Dove—the values should be changed to 0.214 and 0.190 milligrams per kilogram per body weight per day (mg/kg

BW/day), respectively. The proportion of soil ingested for the Mourning Dove does not match the reference provided—the value should be 0.139. Also, the table specifies that the Mourning dove feeds 100 percent on terrestrial invertebrates; however, the Mourning Dove is a granivore, and its diet should be specified as 100 percent terrestrial plants. The footnote for the “IRfood” should be changed to Table 1 rather than Table 3.

9. **Appendix C, Table 5.6.** The table provides the exposure parameters for the mammalian indicator species. The table is missing the data for the proportion of soil ingested for all three species. The values should be for the Short-Tailed Shrew, 0.03; for the Meadow Vole, 0.032; and for the Long-Tailed Weasel, 0.043. Also, the table specifies that the Meadow Vole feeds 100 percent on terrestrial invertebrates; however, the Meadow Vole is a granivore, and its diet should be specified as 100 percent terrestrial plants. The footnote for the “IRfood” should be changed to Table 1 rather than Table 3.
10. **Appendix C, Table 5.7.** The footnotes should provide a full reference to “U.S. EPA Region 10.” The table identifies the source of a number of equations for calculation of constituents of potential ecological concern (COPEC) in dietary items as “e”; however, no information is provided on that source, so the equations associated with “e” could not be verified.
11. **Appendix C, Table 5.9.** The table identifies the source for the mammalian toxicity reference value for xylene as “The.” The footnotes should provide a correct reference for xylene. The footnotes should provide a full reference to “U.S. EPA Region 9.”
12. **Appendix C, Table 6.1.** No footnote(s) in this table identify the source(s) of the modified exposure parameters for the American Woodcock and Short-Tailed Shrew. This source information must be added to the table.

APPENDIX D GENERAL COMMENTS

1. The text states that groundwater does not appear to discharge to the river except at the northwestern corner of the site. During the conference call on May 6, 2013, the agencies raised a concern that groundwater/surface water interaction may be greater than suggested. Groundwater flow maps provided for five different gauging events show that during each event, the groundwater elevation at well MW-7 was lower than the groundwater elevations at adjacent wells MW-5 and MW-8, indicating that groundwater may also be discharging to the river near well MW-7 in the north central part of the site. Therefore, GSI compliance wells should span a larger stretch along the river and should include MW-5, MW-7, MW-8, MW-15, MW-10, MW-11, and MW-12. Alternatively, additional characterization of the relationship between groundwater and surface water could be attained to further support the limited number of GSIC-compliant wells proposed.

2. Given the groundwater flow patterns shown on Figures 2.20 through 2.24, monitoring wells MW-9, MW-20, MW-14, MW-13, and MW-12 should be used to evaluate potential off-site migration of contaminants.
3. The text states that groundwater is being evaluated relative to MDEQ Part 201 GSIC and DWC. The text should also discuss federal drinking water MCLs and present both.
4. A summary table showing the number and locations of compliance wells considered, the type of each compliance well (GSIC or DWC), anticipated frequency of monitoring, and the proposed analyte list should be presented in Appendix D or in an appropriate section within the main body of the FS report.

APPENDIX E GENERAL COMMENTS

1. The remedial alternative cost summaries in Appendix E do not provide details on assumptions or unit rates. Thus, whether the estimated costs are appropriate is unknown. The cost summaries should be expanded to provide details to account for some of the variable rates and the lump sum costs.
2. The text of the FS does not provide details regarding the assumptions for each remedial alternative. The text of the FS should be revised for each remedial alternative to include assumptions and details such as soil volumes excavated, managed on site, and transported for off-site disposal. The text should also provide details on the conceptual plan for the consolidation area and the cap to be installed. Areas and volumes of materials needed for cap construction should be provided. The costs provided in the cost summary tables cannot be evaluated without provision of assumptions used to calculate those costs.

APPENDIX E SPECIFIC COMMENTS

1. **Tables E.2.a and E.2.b, Section A.2.0.** The cost summaries provide the costs assumed for Remedial Alternatives 2a and 2b. The capital costs included in A.2.0 specify costs for excavation by redevelopment area. The unit cost per area ranges significantly from about \$16 per cubic yard to \$108 per cubic yard. No justification or explanation for the variable unit rate is stated, such as differences among areas with accessibility issues, or excessive depths or difficult terrain within some areas. The cost table should be revised to use consistent unit rates or provide details on the assumptions used in determining variable unit rates.
2. **Table E.2.a and E.2.b, Section A.3.0.** The cost summary includes lump sum costs for preparation and/or demolition by redevelopment area. No details are provided regarding these activities or how these lump sum costs were determined. The cost summary should provide details on what preparation and/or demolition activities are planned for the redevelopment areas, so that these costs can be evaluated for appropriateness and

reasonability. It is unknown if these costs include the aboveground storage tank (AST) fuel line and coal tunnel removal, or whether these costs are for asbestos abatement and shoring activities. The costs should provide assumptions such as linear feet and demolition items, at a minimum. Thus, further detail is required regarding the elements included in the preparation and/or demolition costs.

3. **Tables E.2.a and E.2.b compared to E.3.a and E.3.b, Section A.3.0.** The lump sum cost for preparation and/or demolition provided in Remedial Alternative 2 differs slightly from the lump sum cost for this item in Remedial Alternative 3. Why these two remedial alternative costs differ is unclear. The assumptions are not provided to indicate the reason for the difference. Assumptions and details on these cost elements should be provided.
4. **Table E.2.a and E.2.b, Section A.4.0.** The cost summary is for consolidation and capping of the soil exceeding residential/non-residential preliminary remediation goals (PRG). Section A.4.0 includes transportation and off-site disposal of heavily contaminated material. The volume to be transported for off-site disposal is estimated at 11,015 tons. The volume estimated to be excavated is about 14,533 tons. Thus, this alternative provides for consolidation and capping of about 3,500 tons of material, which is only about 25 percent of the material to be excavated. This information should be provided in the text of the FS.
5. **Table E.2.a and E.2.b, Section A.5.0.** The cost summary provides lump sum costs for consolidation of soils on site. These costs should include assumptions or be provided on a unit rate basis. Details on how these costs were determined are required. Information on square footage, on-site transportation, and other material handling is needed to evaluate these costs.
6. **Table E.2.a and E.2.b, Section A.6.0.** The cost summary provides lump sum costs for restoration of each area. Specifics of restoration activities for the areas are unclear. The text should provide a summary of the restoration activities, and the cost summary should provide square foot/acreage to be restored, materials, and the methods of the restoration.
7. **Table E.2.a and E.2.b, Section A.7.0.** A lump sum of \$200,000 for capping the soil is specified. The text and cost summary do not provide assumptions or details on the cap construction. Thus, this cost cannot be evaluated for reasonableness. The conceptual design of the cap should be provided in the text, and the cost summary should include volumes/areas and unit costs for each material to be used in the cap construction.
8. **OM&M Costs, Section B.** The operations, monitoring and maintenance (OM&M) costs of groundwater monitoring for “mixing zone based” and for “mixing zone based with monitored natural attenuation (MNA)” are provided as lump sum costs, and should be accompanied by details on underlying assumptions, such as sample numbers, types, or sampling frequency.

9. **Table E.3.a, Section A.1.0.** The costs for mobilization and setup are provided as lump sum or a monthly rate. The costs provided in this section for Remedial Alternative 3 are higher than for Remedial Alternative 2, but cover the same time duration. Remedial Alternative 3, lacking consolidation and capping of waste, would be expected to incur lower mobilization and set-up costs than Remedial Alternative 2. This cost element should be revised to represent the needs of Alternative 3.
10. **Tables E.3.a and E.3.b, Section A.3.0.** The cost for preparation and/or demolition by redevelopment area listed under Remedial Alternatives 3a and 3b differ slightly from those indicated for Remedial Alternative 2. No justification is provided for why the costs would vary between the Remedial Alternatives 2 and 3. This cost element should be revised accordingly.
11. **Tables E.3.a and E.3.b, Section A.4.0.** The amount of soil listed is 12 tons for the cost to transport and dispose of soil from the mixed residential/commercial area 1. However, the excavation volume for this area is 12 cubic yards. Transportation and disposal cost for this area should be for 18 tons, not 12 tons.
12. **Tables E.3.a, and E.3.b, Section A.5.0.** The total estimated cost for restoration under Remedial Alternative 3 is lower than the restoration cost for Remedial Alternative 2, even though the excavation volume assumptions are the same. The restoration costs should be revised to represent the square footage of the site that will require restoration.
13. **Tables E.4.a and E.4.b, Section A.3.0.** The costs for preparation and pre-excavation work by redevelopment area are all provided as lump sum costs. No details are provided. Thus, it is unclear if these costs represent disposal of abandoned process-related equipment and ancillary structures for each area. This section should provide details on the assumptions regarding each area, as well as units and unit rates.

REFERENCES

- Efroymson, R.A., Suter II, G.W., Sample, B.E., and Jones, D.S. 1997. Preliminary Remediation Goals for Ecological Endpoints. U.S. Department of Energy, Office of Environmental Management. ES/ER/TM-162/R2.
- Michigan Department of Environmental Quality (MDEQ). 2005. "Remediation and Redevelopment Division (RRD), Operational Memorandum No. 1, Technical Support Document – Attachment 6, Part 201 Soil Direct Contact Criteria, Part 213 Tier I Soil Direct Contact Risk-Based Screening Levels." April. On-Line Address: http://www.michigan.gov/documents/deq/deq-rrd-OpMemo_1-Attachment6_285488_7.pdf
- MDEQ. 2007. "RRD Operational Memorandum No. 1, Technical Support Document – Attachment 7, Part 201 Generic Soil Inhalation Criteria for Ambient Air, Part 213 Tier I Soil Inhalation Risk-Based Screening Levels for Ambient Air." July. On-Line Address:

http://www.michigan.gov/documents/deq/deq-rrd-Op_Memo1_Attach7-SoilInhalationCleanupCriteria-TSD_285498_7.pdf

MDEQ. 2012. Revised Part 201 Cleanup Criteria and Part 213 Risk-Based Screening Levels. September 28. On-line address: http://www.michigan.gov/deq/0,1607,7-135-3311_4109_9846_30022-251790--,00.html

U.S. Environmental Protection Agency (EPA). 2004. *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)*. Final. Office of Superfund Remediation and Technology Innovation. EPA/540/R/99/005. July. On-Line Address: <http://www.epa.gov/oswer/riskassessment/ragse/index.htm>

EPA. 2013. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. May. On-Line Address: <http://www.epa.gov/region9/superfund//prg/index.html>

APPENDIX B. HYPOTHETICAL SAMPLE IC RELATIONSHIP MATRIX

Parcel Number	Area of Interest (See Map)*	Contaminants Remaining	Contaminated Media	Engineering Controls+	Cleanup Objective+	Use Restriction/IC Objective+	Conditions for Termination+	IC Instruments (Planned or Implemented):	
0001	Area 1-A	Lead TCE	Surface Soil Subsurface Soil	Landfill cap Vapor extraction	Prohibit dermal contact Prevent damage to cap	No excavation may occur unless approved by state environmental agency.	ICs needed in perpetuity; levels allowing for unlimited use and unrestricted exposure (UU/UE) will not be met by response actions.	Environmental Covenant recorded with the [xxx] County Register of Deeds on September 23, 2003	
					Utilize existing zoning designation of industrial or commercial use	Prevent unacceptable risks due to residential exposures.	ICs needed in perpetuity; levels allowing for UU/UE will not be met by response actions.		Local zoning designation of area as C-1.
	Areas 1-A and 1-B	TCE	Groundwater	Pump and treat system	Prohibit drinking of contaminated groundwater	No drinking water supply wells may be installed at this parcel.	Once MCLs are attained.		State law, section [xxx], prohibiting construction of new drinking water wells when groundwater is above MCLs (planned).
0002	Area 2-B	TCE	Groundwater	None, monitored natural attenuation (MNA)	Prohibit pumping (plume movement)	No water extraction well, of any type, may be installed without prior approval by the environmental agency.	Once MCLs are attained.	Environmental Covenant recorded with the [xxx] County Register of Deeds on September 23, 2003	
0003	Area 3-A	TCE	Groundwater	None, MNA	Prohibit pumping (plume movement)	No water extraction well, of any type, may be installed without prior approval by the environmental agency.	Once MCLs are attained.	Environmental Covenant recorded with the [xxx] County Register of Deeds on September 23, 2003	

*Areas of interest could be located on a map to be included in the ICIAP or to a GIS reference; + As discussed in the decision document.